

# A new species of *Metula* (Gastropoda: Colubrariidae) from the Lower Miocene Chipola Formation of Florida

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## ABSTRACT

*Metula miocenica*, a new species described from the Lower Miocene Chipola Formation of northern Florida, is known only from the holotype that was extracted from an ancient reef deposit along Tennile Creek in Calhoun County. Comparison of the new species reveals similarities with fossil congeners *Metula juveca* (Solander, 1766) from Eocene deposits of England and *Metula pilsbryi* Olsson, 1912, from the Plio-Pleistocene Charco Azul Group of western Panama and Costa Rica.

*Additional key words:* Buccinoidea, Neogene, Tertiary, fossil.

## INTRODUCTION

A number of Recent and fossil species of the genus *Metula* are recorded from around the world, but most are rare. With few exceptions, nearly all living species occur in deep-water environments. The oldest known *Metula* comes from the Eocene, but most of the reported fossil species come from the late Tertiary. In Florida, two species occur in Neogene deposits. *Metula roberti* Olsson, 1967, has been collected from the Pliocene Pinecrest beds (upper Tamiami Formation) along the Kissimmee River and from quarries in Sarasota County, and a second species, described herein, has been recently discovered in the Lower Miocene Chipola Formation in northern Florida. The new species was collected from an ancient reef environment along Tennile Creek in Calhoun County.

Type and figured specimens referred to in this paper are deposited in the Invertebrate Paleontology Division of the Florida Museum of Natural History, University of Florida (UF), Gainesville.

## SYSTEMATICS

Family Colubrariidae Dall, 1904

Genus *Metula* H. and A. Adams, 1853

Subgenus *Metula* H. and A. Adams, 1853

*Metula* (*Metula*) *miocenica* new species  
(Figure 1)

**Description:** Shell elongate-linsiform. Protoconch glossy, 2 1/2 whorls. Teleoconch whorls 7, slightly con-

vex. First two whorls with cancellate sculpture, axial sculpture becoming prominent on third and fourth whorls and with 2 to 3 distinct beaded spiral cords appearing below suture. Surface of remaining whorls generally smooth, exhibiting only very faint cancellate pattern, and spiral cords below shell suture losing their beaded sculpture. Aperture narrow, elliptical, slightly less than 1/2 shell length. Posterior portion of aperture attenuated, anal canal region slightly raised, with lirations on inner surface of outer lip. Columella and parietal wall of aperture with callus wash.

**Type Material:** Holotype, UF 110275, length 24.2 mm, width 8.0 mm.

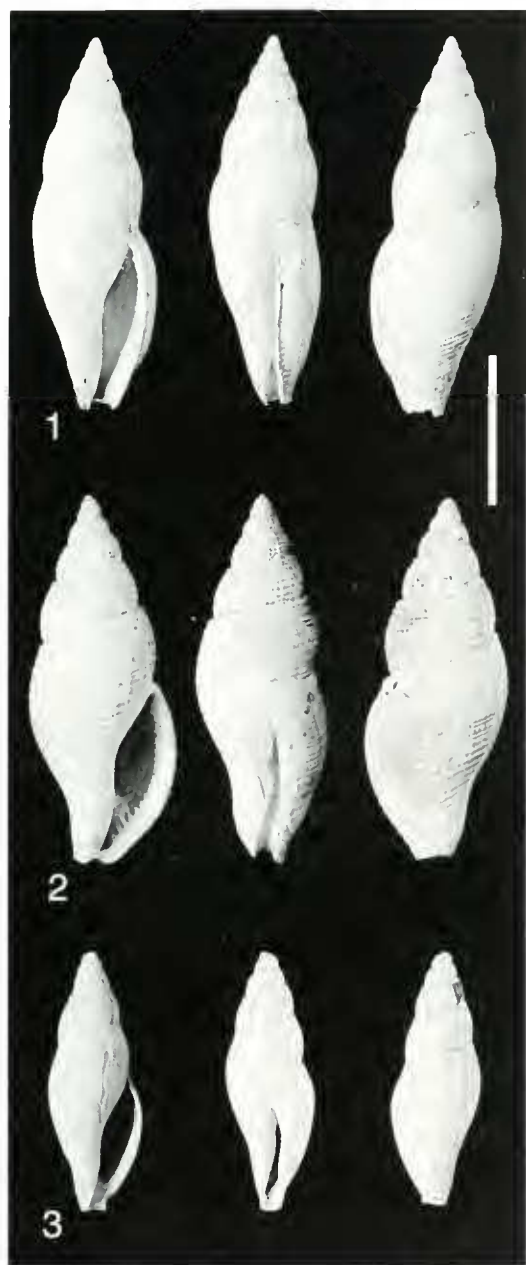
**Type Locality:** Tennile Creek, about 0.75 kilometers west of Chipola River (SE 1/4, Sec. 12, T1N R10W), Calhoun County, Florida (Tulane University locality TU 951), Chipola Formation.

**Distribution:** Known only from the type locality.

**Etymology:** Named for the epoch from which the species was collected.

**Discussion:** The oldest species of the genus *Metula* in the United States come from Eocene deposits in Maryland (Clark and Martin, 1901) and Mississippi and Louisiana (Palmer and Braun, 1966). There are no recorded specimens of *Metula* from the Eocene or Oligocene of Florida. Different species of *Metula* have also been recovered from Eocene deposits in France and England. For comparison purposes a specimen of *Metula juveca* (Solander, 1766) from the Upper Eocene Barton Beds in Hampshire County, England is illustrated (Figure 3) below the newly described *Metula* (*Metula*) *miocenica* (Figure 1). The similarity in sculpture and shape between *M. juveca* and *M. (M.) miocenica* and to other fossil and Recent *Metula* found in the Caribbean suggests an evolutionary linkage between the European and New World species.

Neogene *Metula* are known from numerous locations including New Hebrides (Ladd, 1976; 1982), Fiji (Ladd, 1977), Trinidad (Jung, 1969), Costa Rica (Olsson, 1922;



**Figures 1-3.** Florida fossil *Metula* and an Eocene counterpart from England. 1. *Metula miocenica*, new species, Holotype, UF 110275, length 24.2 mm, width 8.0 mm. 2. *Metula roberti* Olsson, 1967. Selected specimen from Kissimmee Canal, UF 62412, length 23.8 mm, width 9.5 mm. 3. *Metula juncea* Solander, 1766. Selected specimen from Barton Beds, England, UF 1228, length 17.2 mm, width 6.2 mm. Scale bar = 10 mm.

1942), Panama (Woodring, 1964), Dominican Republic (Maury, 1917), and southern Florida (Olsson, 1967). Until now, the earliest Neogene species reported was by Woodring (1964) from the Lower Miocene Culebra Formation of Panama. That species was identified from "molds and incomplete impressions" and bore some re-

semblance to *Metula cancellata* Gabb, 1873. Because of the paucity and incompleteness of material, however, Woodring never described the Panama species.

Olsson and Bayer (1972) divided American *Metula* into several subgenera. In the largest subgenus, *Metula sensu stricto*, they placed those shells that possess an attenuated posterior aperture and long anal canal bordered by a lirated lump on the inner surface of the outer lip. Other members of the genus that lack the aforementioned features were either assigned to their new subgenera *Agassitula* or *Minitula*. The anterior canal of *Agassitula* is long and curved or twisted, whereas the anterior canal of *Minitula* is short and straight. Olsson and Bayer (1972) also named a fourth subgenus, *Floritula*, but were uncertain about its validity. The only known representative of this subgenus is the Florida Pliocene species *Metula roberti* Olsson, 1967. Since there are only trivial differences between the subgenera *Floritula* and *Metula* described by Olsson and Bayer (1972), Ben and Maxwell (1987) listed *Floritula* as a synonym for *Metula*. They also reclassified *Metula (Minitula) minor* Olsson and Bayer, 1972, the type species of the subgenus *Minitula*, into the family Columbellidae. Because of the attenuated posterior aperture and lirations on the inner surface of the outer lip, the Chipola *Metula* is assigned to the subgenus *Metula*.

There has been considerable uncertainty about the correct family classification of *Metula*. In a review of this controversy, Bouchet (1988) noted that some investigators opted to keep the genus in the family Buccinidae, while others felt that certain anatomical features of the radula justified assignment to the family Colubrariidae. Ben and Maxwell (1987), in an extensive revision of the *Colubraria* and related genera, classified *Metula*, *Colubraria*, and several related genera in the subfamily Pisaniinae into the Buccinidae. Vermeij (2001), in his review of the subfamily Pisaniinae, supported the placement of *Metula* in the Colubrariidae, which he maintained as a separate family near Buccinidae. His decision was based upon anatomical characteristics, shell morphology, and ecological factors. Commensurate with his findings, herein we follow Vermeij's assignment.

*Metula (Metula) miocenica* comes from the Lower Miocene Chipola Formation, which has an age range of 18 to 19 million years (Jones et al., 1993). Therefore, this newly discovered species is the oldest Neogene *Metula* thus far reported. In overall form it bears a stronger similarity to *M. juncea* from the Upper Eocene Barton Beds of England (Figure 3) than to the more recent Florida Pliocene species *Metula (Metula) roberti* (Figure 2). Among Neogene species, *M. (M.) miocenica* is similar to *Metula (Metula) pilsbryi* Olsson, 1942, from the Pliocene-Pleistocene Charco Azul Group in western Panama and Costa Rica. However, *M. (M.) miocenica* is about half the size of *M. (M.) pilsbryi* and lacks the well-defined cancellate sculpturing on all but the first two whorls of the teleoconch. *Metula (M.) kerensis* Ladd, 1976, from Pleistocene deposits in New Hebrides is also similar to *M. (M.) miocenica*. Both have approximately the same

shell dimensions and contours and both possess a very faint cancellate sculpture on the later whorls. However, *M. (M.) miocenica* has two to three prominent spiral bands that appear just below the sutures and in the early whorls there is also a more prominent cancellate sculpture pattern. Among extant Caribbean species *M. (M.) miocenica* is most similar to *Metula (Metula) ellena* Olsson and Bayer, 1972. Both have approximately the same body dimensions and shape and both have fine to smoothly cancellate body sculpturing. *Metula (M.) miocenica*, however, is more slender, has a more elevated spire, and the body whorl is more sharply angled toward the base.

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#### LITERATURE CITED

- Ben, A. G. and P. A. Maxwell. 1957. A revision of the fossil and living gastropods related to *Plesiotriton* Fischer, 1854 (Family Cancellariidae, Subfamily Plesiotritoninae n. subfam.), with an appendix: genera of Buccinidae (Pisaniinae related to *Cobularia* Schumacher, 1817). New Zealand Geological Survey Paleontological Bulletin 54: 1-110.
- Bouchet, P. 1988. Two new species of *Metula* (Gastropoda: Buccinidae) with a description of the radula of the genus. *The Nautilus* 102: 149-153.
- Clark, W. B. and G. C. Martin. 1901. The Eocene deposits of Maryland. Maryland Geological Survey, lxx + 331 pp.
- Jones, S. J., Mueller, P. A., Hodell, D. A. and Stanley, E. A. 1993. <sup>87</sup>Sr-<sup>87</sup>Sr geochronology of Oligocene and Miocene marine strata. In: Zullo, V. A., W. B. Harris, T. M. Scott, and R. W. Portell (eds.), *The Neogene of Florida and adjacent regions*. Proceedings of the third Bald Head Island Conference on coastal problems. Florida Geological Survey, Special Publication 37, pp. 15-26.
- Jung, P. 1969. Miocene and Pliocene mollusks from Trinidad. *Bulletins of American Paleontology* 55:247: 259-657, pls. 13-60.
- Ladd, H. S. 1976. New Pleistocene Neogastropoda from the New Hebrides. *The Nautilus* 90:4: 127-135.
- Ladd, H. S. 1977. Cenozoic fossil mollusks from western Pacific islands: gastropods (Eratoidae through Harpidae). United States Geological Survey Professional Paper 533, iv + 84 pp., 23 pls.
- Ladd, H. S. 1982. Cenozoic fossil mollusks from western Pacific islands: gastropods (Enniidae and Volutidae through Terebridae). United States Geological Professional Paper 1171: iv + 100 pp., 41 pls.
- Maury, C. J. 1917. Santo Domingo type specimens and fossils, part I: Mollusca. *Bulletins of American Paleontology* 5:29: 1-251, 39 pls.
- Olsson, A. A. 1922. The Miocene of northern Costa Rica, with notes on its general stratigraphic relations: Part I. *Bulletins of American Paleontology* 9:39: 1-167, 15 pls.
- Olsson, A. A. 1942. Tertiary and Quaternary fossils from the Burica Peninsula and Costa Rica. *Bulletins of American Paleontology* 27:106: 157-234.
- Olsson, A. A. 1967. Some Tertiary mollusks from south Florida and the Caribbean. *Paleontological Research Institution*, 45 pp., 9 pls.
- Olsson, A. A. and F. M. Bayer. 1972. American *Metulas* (Gastropoda: Buccinidae). *Bulletin of Marine Science* 22: 900-925, 14 figs.
- Palmer, K. A. W., and D. C. Brann. 1966. Catalogue of the Paleocene and Eocene Mollusca of the southern and eastern United States, part 2. Gastropoda. *Bulletins of American Paleontology* 45 (218): 467-1057, pls. 1-5.
- Vernceij, G. J. 2001. Taxonomy, distribution, and characters of the pre-Oligocene members of the *Cantharus* group of Pisaniinae (Neogastropoda: Buccinidae). *Journal of Paleontology* 75: 295-309, 1 pl.
- Woodring, W. P. 1964. Geology and paleontology of Canal Zone and adjoining parts of Panama. Description of Tertiary mollusks (gastropods: Columbelloidae to Volutidae). United States Geological Survey, Professional Paper 306-C: 241-297, pls. 39-47.